STUTTERING

The Effect of Treatment with D-Amphetamine and a Tranquilizing Agent, Trifluoperazine

A Preliminary Report on an Uncontrolled Study

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■ *In an institution for the mentally retarded, an uncontrolled study was made on the effects of d-amphetamine, d-amphetamine followed by trifluoperazine, and of combined d-amphetamine and trifluoperazine on stuttering. Of 28 patients to whom d-amphetamine was given, 14 showed improvement after one month's treatment. Eight more showed improvement when trifluoperazine was given for one month to those who did not improve on d-amphetamine. In many cases, improvement was sustained at least six months after treatment was discontinued.*

Treatment with d-amphetamine was apparently more effective in patients with functional than with organic retardation.

IN RECENT YEARS a variety of psychopharmacologic agents have been increasingly used in the control or treatment of functional disorders. In 1953, Ginn,[3] using d-amphetamine in treatment of behavior disorders in children, noted improvement in the speech of two of four stutterers. The senior author of the present study, who stuttered, noted decided improvement in speech while taking d-amphetamine for obesity in 1957. An exploratory study done by him in 1957 on five adult male patients indicated that d-amphetamine improves speech in stutterers and that controlled studies were merited. In 1961, Fish and Bowling,[2] in a double blind study, observed that five of eleven stutterers showed improvement in speech. None of the other speech defects of patients in that study were improved significantly by d-amphetamine. Continuing administration of d-amphetamine for three months did not bring about improvement in the six stutterers who were not benefited earlier.

It was suggested that perhaps those stutterers who do not improve on d-amphetamine, which is a psychic and muscular stimulant, might improve on a tranquilizer. Perusal of the literature[1,4,5,6] indicated that tranquilizers apparently do not improve speech in stutterers. However, it was felt that selection of patients who did not improve on d-amphetamine might be worth a trial with a tranquilizer.

Materials and Methods

At Fairview State Hospital, an institution for the mentally retarded, there were 34 stutterers

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whose degree of stuttering had recently been evaluated. The criterion for evaluation was a practical one: the extent to which stuttering interfered with verbal communication. Three categories, severe, moderate and mild, were used. The patients ranged in age from 10 to 59 and in intelligence quotient from 21 to 77. There were five females and 29 males. Of these 34 patients, six who were not available to receive medication on the day the study was begun, October 1, 1962, were used as controls. The other 28 were given a one-month treatment with d-amphetamine spansule, 15 mg each morning. All other medication such as anticonvulsants and antibiotics, as well as all the scheduled activities, were continued as previously. A one-month trial period was chosen because previous studies showed that most of the improvement, if it occurred at all, came within one month.

Those patients who did not improve on d-amphetamine after one month were given trifluoperazine (Stelazine®) 2 mg three times a day for one month. Treatment was discontinued on all those who improved. Those who did not improve on trifluoperazine were then given a one-month treatment with combined d-amphetamine and trifluoperazine in the same dosage.

The results were as follows:

Drug	Degree of Stuttering	No.	Results: Improved To		Not Improved	Worse
d-amphetamine	Severe	8	Moderate or Mild	3	5	0
	Moderate	10	Mild	6	3	1
	Mild	10	None	5	4	1
	Total	28		14	12	2
Trifluoperazine	Severe	6	Moderate or Mild	4	2	
	Moderate	4	Mild	3	1	
	Mild	2	None	1	1	
	Total	12		8	4	0
	Not available	2				
		14				
Combined d-amphetamine and trifluoperazine	Severe	2			2	
	Moderate	1			1	
	Total	3		0	3	0
	Not available	1				
		4				

All patients who were still available were reevaluated in January 1963, after all treatment was discontinued (three months after the start of the treatment program) and again in July 1963, to determine if improvement was sustained after cessation of treatment. The results of these reevaluations were as follows:

	Status of Improvement: January 1963		July 1963	
	Sustained	Not Sustained	Sustained	Not Sustained
Patients who improved on:				
d-amphetamine	6	3	5	3
trifluoperazine	4	2	2	3
Total	10	5	7	6
Five controls	No change		No change	

The per cent of sustained improvements might possibly have been higher if those not available for reevaluation could have been tested, since most of them had left the hospital because of general improvements in their condition.

In order to determine if differences in the kind of mental retardation might be a factor in the differing responses of the stutterers to d-amphetamine or to trifluoperazine, two broad categories of causes of mental retardation were used, *organic* (congenital malformations, brain injuries due to disease or trauma, anoxemia at birth, inborn errors of metabolism and the like) and *functional* (mental retardation with no known anatomical or metabolic cause, or retardation owing to emotional disturbance or psychosis). The numbers of patients

in each category and the numbers in each who were improved by two methods of treatment were as follows:

	Organic		Functional	
	Improved	*Not Improved*	*Improved*	*Not Improved*
d-amphetamine	3	7	11	7
trifluoperazine	5	2	3	2

Proportionally, the results with d-amphetamine were better in the functional than in the organic group. With trifluoperazine, the converse was true.

Discussion

The present study corroborates previous studies in that approximately 50 per cent of stutterers improved on a d-amphetamine regimen, and a considerable proportion sustained this improvement for at least six months after cessation of treatment.

A total of 22 out of 26 available patients showed improvement on one or another of the regimens. The five control patients who were reevaluated showed no change in their stuttering during this total period. The question arises whether the improvement on trifluoperazine was due to the tranquilizer *per se* or may have owed something to the previous "priming" with d-amphetamine. Or possibly there are two types of stutterers, one affected by d-amphetamine and the other affected by trifluoperazine. In view of previous negative reports of the effects of tranquilizers alone on stuttering, the latter two possibilities should be further investigated.

The mechanism of action of d-amphetamine on stuttering is not known. It is possible that d-amphetamine with its psycho-stimulating properties produces a sense of well-being, thereby reducing fear and anxiety and thus breaking the habit pattern: stuttering, causing fear and anxiety, causing more stuttering. That this mechanism is the more plausible is suggested by two observations: (1) Stuttering on a functional basis or in the functionally mentally retarded is improved by d-amphetamine more often than stuttering associated with organic mental retardation; and (2) the improvement is sustained in many cases long after cessation of treatment. There is also the possibility that the patients with organic mental retardation who improved had a functional overlay as a cause of stuttering. Another mechanism of action that has been suggested is that stutterers, having a response-weakness in their muscles of speech, respond to a priming of the skeletal muscular system by a muscle stimulant, similar to the response of symptoms of myasthenia gravis to ephedrine or neostigmine.

Further studies that appear to be in order are:

1. A controlled double blind study with d-amphetamine on stutterers with normal intelligence.
2. A study with a "psychic energizer" which is not a muscle stimulant.
3. A study with a muscle stimulant which is not a "psychic energizer."
4. A controlled double blind study with d-amphetamine followed by trifluoperazine, as opposed to trifluoperazine followed by d-amphetamine.
5. Use of tablet form of d-amphetamine instead of time-release spansules (personal communication from a physician who has used both, indicates that there is more improvement with the tablet form).
6. Intermittent use of d-amphetamine, one month in every three months for one or more years, as opposed to use of d-amphetamine for one month followed by speech therapy for a similar period.
7. Evaluation by speech therapists of changes in the whole stuttering syndrome, rather than just changes in verbal stuttering, before and after one month's therapy with d-amphetamine.

The authors are carrying out studies proposed in Items 1 and 7 in the above list and plan to do others as circumstances permit. However, reports by others doing similar studies would be most welcome.

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